In the Claims:

1. (Currently Amended) A method of detecting combustion inefficiency in an engine having multiple cylinders, comprising:

detecting ~~a peak in an~~ oxygen levels in an exhaust stream[[;]] with a sensor;

~~linking the peak in the oxygen level to a particular cylinder in the engine; and~~

~~reporting the peak in the oxygen level to an operator in human readable format.~~

connecting the sensor to an external probe;

comparing sensor readings to a database of fingerprints associated with the external probe, wherein the database of fingerprints comprises fingerprints of engines having combustion inefficiencies; and

providing an indication as to which cylinder has the combustion inefficiency.

2. (Currently Amended) The method of claim 1 wherein detecting the ~~peak in the~~ oxygen levels with the sensor comprises ~~detecting the peak in the oxygen level with~~ using a lambda sensor.

3. (Currently Amended) The method of claim 2 wherein ~~detecting the peak in the oxygen level with the~~ using the lambda sensor comprises ~~detecting the peak in the oxygen level with a~~ using a lambda sensor positioned in an exhaust manifold.

4. (Currently Amended) The method of claim 2 wherein ~~detecting the peak in the oxygen level with the~~ using the lambda sensor comprises ~~detecting the peak in the oxygen level with a~~ using a lambda sensor positioned proximate a catalytic converter.

5. (Currently Amended) The method of claim [[2]] 1 ~~further comprising associating each of the multiple cylinders with a unique oxygen sensor~~ wherein comparing sensor readings to the database of fingerprints comprises linking a peak in the oxygen levels to a particular cylinder in the engine so as to identify a misfire in the particular cylinder.

6. (Currently Amended) The method of claim [[5]] 1, wherein ~~linking the peak in the oxygen level to a particular cylinder comprises discriminating between the unique oxygen~~

~~sensors as to which oxygen sensor detected the peak in the oxygen level~~ the database of fingerprints is derived empirically.

7. (Currently Amended) The method of claim 1 wherein detecting the peak in the oxygen level comprises directly detecting the oxygen levels.

8. (Currently Amended) The method of claim 1 wherein detecting the peak in the oxygen levels comprises inferentially detecting the oxygen levels.

9. (Original) The method of claim 1 further comprising generating a timing reference associated with the engine.

10. (Currently Amended) The method of claim 9 further comprising linking the timing reference ~~with the peak~~ to the database of fingerprints.

11. (Currently Amended) The method of claim [[10]] 6 wherein ~~linking the peak in the oxygen level to the particular cylinder in the engine comprises comparing the linked timing reference and peak to a fingerprint for the engine~~ the database of fingerprints has different fingerprints for different types of engines.

12. (Currently Amended) The method of claim [[11]] 6 wherein the ~~fingerprint is one of multiple fingerprints assembled in a database~~ database of fingerprints is derived empirically by introducing known combustion inefficiencies and recording oxygen levels for the known combustion inefficiencies.

13. (Currently Amended) A computer readable medium having software stored thereon, said software adapted to detect combustion inefficiency in an engine having multiple cylinders by:

accepting data from a sensor through an external probe;

comparing [[a]] sensed oxygen levels from the sensor coupled with a timing reference to a database of fingerprints [[;]] , wherein the database of fingerprints comprises fingerprints of engines having combustion inefficiencies; and

providing an indication as to which cylinder has the combustion inefficiency.

~~determining a peak in the sensed oxygen level; and~~

~~reporting the peak in the sensed oxygen level to an operator in human-readable format.~~

14. (Currently Amended) The computer readable medium of claim 13 whercin said software accepting data from the sensor through the external probe is adapted to ~~receive inputs from probes~~ operate with an external probe connected to a lambda sensor and a timing reference generator.

15. (Currently Amended) The computer readable medium of claim 13 wherein said software is adapted to identify that the cylinder is misfiring.

16. (Currently Amended) The computer readable medium of claim 13 wherein said software is adapted to generate [[a]] the timing reference for engines selected from [[the]] a group consisting of those using a distributorless ignition system (DIS) and those using a distributor system through the calculation of an offset.

17. (Currently Amended) The computer readable medium of claim 13 wherein said software is adapted to ~~receive the sensed oxygen level from a probe connected to~~ accept data from the sensor through the external probe is adapted to work with a sensor that senses oxygen levels indirectly.

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24. (Currently Amended) The method of claim [[22]] 1 further comprising using a known firing order of the multiple cylinders to assist in determining which cylinder released [[the]] exhaust gases detected by the sensor.

25. (Previously Presented) The computer readable medium of claim 13 wherein the database of fingerprints comprises a database of fingerprints relating to empirically derived oxygen levels.

26. (Previously Presented) The computer readable medium of claim 25 wherein the empirically derived oxygen levels are derived from introducing a known combustion inefficiency into a normally operating engine and wherein said fingerprints comprise data related to oxygen levels detected in an exhaust path associated with the normally operating engine.

27. (New) A method of detecting a misfire in an engine having multiple cylinders comprising:

connecting an external probe to a sensor associated with an exhaust path of the engine;

collecting readings from the sensor relating to oxygen levels within the exhaust path;

comparing, through software, the oxygen levels collected from the sensor to a database of fingerprints; and

providing an indication as to which of the multiple cylinders is misfiring.

28. (New) The method of claim 27 further comprising forming the database of fingerprints empirically.

29. (New) The method of claim 28 wherein forming the database empirically comprises, for a given model of engine, sequentially introducing a known misfire into each cylinder of the given model of engine and recording oxygen levels associated with each introduced known misfire for each cylinder and associating each recording of oxygen levels with a timing reference.

30. (New) The method of claim 29 wherein comparing, through software, the oxygen levels collected from the sensor to the database comprises identifying to the software a type of engine being tested and comparing the type of engine to a corresponding type of engine in the database of fingerprints.

31. (New) The method of claim 29 further comprising identifying a cylinder within the engine that has a combustion inefficiency short of a misfire instead of providing the indication as to which of the multiple cylinders is misfiring.